radiotherapy alone. Direct and indirect costs were derived from published peer-reviewed literature or government data. Utilities were obtained from a previously published cost-utility analysis of temozolomide and carmustine wafers in newly diagnosed glioblatoma. Univariate and threshold sensitivity analyses were conducted on all survival data, input costs, utilities, and other important parameters. **RESULTS:** The addition of temozolomide to the standard radiotherapy regimen was associated with a base-case incremental cost-effectiveness ratio of $154,933 per quality-adjusted life-year. This is considerably higher than the only other comparable estimate, which assumed the perspective of the UK National Health Service and did not include indirect costs. The model was most sensitive to the utility associated with the use of temozolomide during the maintenance phase of stable disease treatment. **CONCLUSIONS:** The base-case incremental cost-effectiveness ratio lies just beyond a willingness-to-pay threshold of $150,000 per quality-adjusted life-year. However, sensitivity analysis revealed numerous plausible scenarios that produced lower estimates. Notably, a 10% increase in the utility associated with stable disease treatment produced an estimate of $120,743 per quality-adjusted life-year. Given these results and the lack of alternative treatments for glioblastoma, we conclude that temozolomide's use in this setting is not definitively cost-effective. However, better estimates of relevant health state utilities could greatly improve cost-effectiveness models for glioblastoma treatments.

PCN79

COST EFFECTIVENESS OF HUMAN PAPILLOMAVIRUS VACCINATION FOR THE PREVENTION OF CERVICAL CANCER IN URBAN REGIONS OF CHINA

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OBJECTIVES: To determine the costs, outcomes and level of cost-effectiveness associated with HPV vaccination in urban China. **METHODS:** A Markov model of HPV vaccination in urban China is used to follow hypothetical females from age 12 to age 92. The individuals in the model are assumed to be vaccinated at age 12 and the rates of HPV infection, squamous intraepithelial lesions, cervical cancer and death are measured on an annual basis for 80 years. All costs and outcomes are discounted. **RESULTS:** In our base case analysis, the administration of HPV vaccine could reduce cervical cancer rate by 65%. In our model, HPV vaccination is found to be cost-saving. The implementation of HPV vaccination results in an increase of 0.6 QALYs over the lifetime of each individual. The total lifetime discounted costs with vaccination are $766 dollars per individual lower than the total costs without vaccination. Under all scenarios examined in our sensitivity analysis, the total costs with vaccination are reduced when compared to current practice with an increase in QALYs as well. **CONCLUSIONS:** Compared to current practice in China, which does not include cervical cancer screening, HPV vaccination appears to be cost-saving. China has a coverage rate of 95% for its childhood immunization program. Incorporating HPV vaccination into this program could likely be done with a minimal amount of effort. Our results provide strong evidence for the implementation of HPV vaccination programs in urban China.

PCN80

ECONOMIC EVALUATION OF SUNITINIB FOR THE FIRST-LINE TREATMENT OF METASTATIC RENAL CELL CARCINOMA IN RUSSIAN FEDERATION

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OBJECTIVES: The purpose of this research was to determine the cost-effectiveness of sunitinib in terms of the RF health care system. In this research, the comparisons of costs and effectiveness with patients treated by sunitinib, IFN-α, sorafenib and bevacizumab with IFN-α were studied, based on the RF health care system conditions. **METHODS:** In this Pharmacoeconomic research the cost-effectiveness analysis (CEA) and cost-utility analysis (CUA) were studied. The results were estimated in life years before the disease progression (PfLYs) and prolonged life years (LYs) within CEA and quality-adjusted life-years (QALYs) within CUA. The results of these analyses were illustrated in incremental cost-effectiveness rate (ICER) and cost-utility rate (ICUR). The cost-utility analysis was chosen as the main analytical method, because sunitinib was supposed not only to affect survivability but quality of life as well. **RESULTS:** The data of the research illustrates that sunitinib usage as a first-line drug for mRCC patients provides a significant health improvement in terms of PFS and OS, expressed in ICER index, equal to 3,742,060 rub and 955 451 for a saved life year, and ICUR index, equal to 6,787,955 rub and 2,912,714 rub for QALY in comparison with IFN-α and sorafenib respectively. High values of these indexes are mainly caused by high cost of sunitinib and relatively low cost of healthcare resources in Russian Federation. In comparison with bevacizumab with IFN-α, sunitinib is dominant, providing better efficacy with lower cost. **CONCLUSIONS:** These results suggest that sunitinib is a cost-effective alternative to sorafenib, bevacizumab with IFN-α, and sorafenib as a first-line treatment of mRCC.

PCN81

HEALTH RELATED QUALITY OF LIFE, DIRECT MEDICAL, NON-MEDICAL, AND INDIRECT COST ANALYSIS OF STAGE III COLORECTAL CANCER PATIENTS RECEIVING DIFFERENT ADJUVANT CHEMOTHERAPY TREATMENTS IN TAIWAN

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OBJECTIVES: To evaluate the health-related quality of life (HRQOL) and to compare direct medical, non-medical and indirect cost of stage III colorectal cancer(CRC) patients receiving either capecitabine-based or 5-FU/LV-based adjuvant treatments from societal perspective. **METHODS:** An observational follow-up study to collect HRQOL and cost data from stage III CRC patients were conducted in 12 hospitals from 2008 to 2010. A total of 535 patients were invited to complete questionnaires during the study period: at study baseline (Q0), at 3 months after the initial adjuvant treatment (Q3), and at 1 month after treatment had finished (Q7) using the EORTC QLQ-C30 and QLQCR-38 questionnaires. Cost data were obtained from National Health Insurance Research Database (NHIRD), patient questionnaire (Q3) and productivities loss from Manpower Utilization Survey. 66% of patients completed the questionnaire as per protocol and their data were the basis for further analysis. Propensity score matching (PSM) method was used to reduce selection bias and to avoid endogenous problems by matching variables, i.e. age, gender, location of tumor, marital status, education, work and the number of comorbidities between two groups. After PSM, a total of 239 patients were analyzed. **RESULTS:** In capecitabine-based treatment, Physical, Role, Emotional, Social, Global Health status, Body Image, Future perspective Functioning, Fatigue, Pain, Diarrhea, Stoma-related problem, and Weight loss Symptoms were all improved from Q0 to Q3 and Q0 to Q7. In 5-FU/LV-based treatment, Physical, Role, Social, Global health status Functioning, GI tract and Weight loss Symptoms also improved. Total direct medical, direct non-medical, and indirect cost of capecitabine-based and 5-FU/LV-based treatment were NT$29,452 (USD $982) and NT$55,200 (USD $1,840), respectively. **CONCLUSIONS:** This real-life study shows that adjuvant chemotherapy has no negative impact on HRQOL during study period. Capecitabine-based treatment performs better in most functioning aspects of HRQOL and is cost-saving in direct and indirect resources utilization from societal perspective.

PCN82

PHARMACOECONOMICAL EVALUATION OF MULTIPLE MIELOMA TREATMENT WITH LENALIDOMIDE IN THE RUSSIAN FEDERATION

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OBJECTIVES: To assess the cost-effectivness of lenalidomide in treatment of the second and third lines of multiple myeloma in the Russian Federation. **METHODS:** We developed an economic model of multiple myeloma disease to calculate the cost of diagnosis and treatment of second and third-line therapy of lenalidomide and bortezomib. The efficacy of drugs (time to progression- TTP) was obtained from clinical trials: MM - 009/-010 for lenalidomide; APEX for bortezomib. TTP for lenalidomide was 21.2 months and for bortezomib - 16.4 months. Medical care costs were estimated from the standard of multiple myeloma treatment, which was developed and published by Ministry of public health. **RESULTS:** A CER of lenalidomide in the second line therapy was 468,110,84 RUB (11,529,82 €) which is lower then use of bortezomib in the second line therapy 605 118,89 RUB (14,904,4 €). **CONCLUSIONS:** Application of lenalidomide in second-line therapy of multiple myeloma is dominated alternative of treatment.

PCN83

NOVEL TARGETED DRUG THERAPIES IN THE CANCER SETTING: A DESCRIPTIVE COMPARISON OF EFFICACY AND COST

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OBJECTIVES: For many years, the backbone of cancer treatment has been the use of cytotoxic agents. There has been an emergence of new drugs, however, that are more specific to the target. Some of these agents have resulted in a prolongation of survival and even clinical cures in some cancers. In order to compare and contrast the costs and benefits of these new drug therapies, a descriptive evaluation across seven major tumour types was undertaken. **METHODS:** A literature search was conducted from 2000 to 2011 to identify randomized trials of novel therapies in breast, lung, colorectal, kidney, lymphoma, multiple myeloma and chronic myelogenous leukemia. Clinical outcomes in terms of progression free (PFS) and overall survival (OS) benefit were extracted. Economic data in terms of cost per month of therapy was obtained from a U.S. cancer clinic. **RESULTS:** Approximately 22 novel therapies were approved across the seven cancers. Four of the 22 (18%) were used with a curative intent while the remainder were used in the palliative setting (n=18). Ten of these 18 (56%) latter agents also demonstrated an OS benefit. The median month cost for novel therapies used with a curative intent and those with a survival benefit in the palliative setting were $5450 and $6450 respectively. In contrast, the median monthly cost for drugs that did not offer either of these benefits was $7900. Of the agents identified, imatinib, lenalidomide, rituximab and trastuzumab provided the greatest magnitude of benefit for both PFS and OS and would be considered major clinical advances. **CONCLUSIONS:** Approximately 64% of novel drugs approved over the past 11 years are used with a curative intent or provide a survival benefit in the palliative care setting. The monthly cost for agents not providing these benefits, however, was higher, indicating a disconnect between efficacy and cost.

PCN84

ECONOMIC EVALUATION OF THE USE OF CAPECITABINE AS FIRST-LINE TREATMENT OF METASTATIC COLORECTAL CANCER IN MEXICO

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OBJECTIVES: To identify which is the chemotherapy scheme alternative that minimizes costs in the 1st line treatment of Metastatic Colorectal Cancer (mCRC) in Mexico. **METHODS:** Cost minimization comparing different chemotherapy schemes for mCRC: XELOX (Capecitabine+Oxaliplatin), FOLFOX-4 (Oxaliplatin+Fluorouracil+folinic acid), FOLFOX-6 (Oxaliplatin+ Fluorouracil+ folinic acid) and FOLFIRI (Irinotecan+Fluorouracil+folinic acid). It was performed a

Markov model with 3 stages: disease progression, disease free progression and death in a time horizon of 3 years. Costs were based on direct medical costs of the institution, drug administration costs and cost for the management of adverse events and they are expressed in US dollars. **RESULTS:** The average treatment cost for the alternatives were: $ 16,133.78 for XELOX, $ 25,690.58 for FOLFOX-4, $ 27,686.35 for FOLFOX-6 and $ 21,904.12 for FOLFIRI. XELOX is the least costly alternative. The difference in costs is mainly due to the difference in management costs and the presence of grade 3-4 adverse events, mainly neutropenia. Based on clinical trials, FOLFOX-6 presented neutropenia (47%), FOLFOX-4 (44%) and FOLFIRI (26%), while the most severe adverse event was diarrhea with XELOX (12%). In the disease management, FOLFOX-6, FOLOFX-4 and FOLFIRI require two hospitalizations per cycle for the application of the drug. Instead, XELOX requires only one chemotherapy session. Since Capecitabine is orally administered, not only minimizes the costs of administration, also has a better safety profile with less adverse events. **CONCLUSIONS:** The use of Capecitabine combined with Oxaliplatin scheme as first-line treatment of metastatic colorectal cancer, is the alternative that minimizes costs to the health institutions, as well as improve quality of life resulting from Capecitabine's oral administration.

PCN85

ECONOMIC EVALUATION IN THE TREATMENT OF ADVANCED AND/OR METASTATIC GASTRIC CANCER FROM THE PERSPECTIVE OF THE PUBLIC HEALTH SYSTEM IN MEXICO

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OBJECTIVES: To identify which of the different chemotherapy alternatives minimizes costs for the treatment of advanced and/or metastatic Gastric Cancer (GC) in Mexico. **METHODS:** A cost minimization was performed considering the alternatives: EOX (epirubicin+oxaliplatin+capecitabine), EOF (epirubicin+oxaliplatin+fluorouracil), ECX (epirubicin+cisplatin+capecitabine) and ECF (epirubicin+cisplatin+ fluorouracil) for the treatment of advanced and/or metastatic gastric cancer (advGA) using a Markov model with 3 stages: progression, disease free progression and death. For a time horizon of 3 years, it was taken into account direct medical costs for the disease management, drug and its application cost, and costs incurred in the management of the associated adverse events. Costs are expressed in USD dollars. **RESULTS:** ECX was the alternative with less costs ($6,293), followed by EOX ($7,692). The chemotherapy combinations based on capecitabine proved to be the least expensive. The alternative EOF had a cost of $10,904, while ECF was $9,873. The factor that increased costs of EOF and ECF was the drug administration costs, as they require to be administered as daily intravenous infusions in comparison of the oral administration of capecitabine. Therefore, the administration costs of ECX and EOX represent only 4.76% of the administration costs of ECF and EOF. The results of the univariate sensitivity analysis confirmed savings with capecitabine versus ECF from $5,721 to $6,209 and versus EOF from $5,691 to $6,178 in the total management costs. The probabilistic analysis results also confirmed that in the ECF scheme versus ECX, the combination with capecitabine is a cost-saving alternative. ECX and EOX are alternatives that minimize costs at 100% of cases compared to ECF and EOX respectively. **CONCLUSIONS:** The oral administration of capecitabine is the factor that minimizes the cost of the alternatives in the chemotherapy combination schemes, also, the safety profile of capecitabine helps incurring in less costs associated to the management of side adverse events.

PCN86

COST-UTILITY ANALYSIS OF NILOTINIB COMPARED TO IMATINIB FOR NEWLY DIAGNOSED CHRONIC MYELOID LEUKEMIA (CML) IN CHRONIC PHASE

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OBJECTIVES: CML is a clonal myeloproliferative neoplastic disorder characterized by a reciprocal translocation between chromosomes 9 and 22, t(9;22)(q34;q11) leading to the formation of the BCR-ABL fusion gene. With the introduction of imatinib, a BCR-ABL tyrosine kinase inhibitor (TKI), survival has improved with durable long-term responses. Nilotinib is a more recently approved second generation TKI indicated for treatment of CML as first- and second-line therapy. Shorter-term clinical trials (24 months) have shown that nilotinib produces a faster cytogenetic response compared to imatinib, but long-term survival outcomes have not yet been reported in clinical trials. The objective of this analysis is to explore the cost-effectiveness of nilotinib compared to imatinib for the treatment of newly diagnosed CML in chronic phase. **METHODS:** Using a healthcare payer perspective, a 72-month Markov state transition model was developed in Microsoft Excel 2007. Major cytogenetic response, progression, and survival rates were obtained from a 24-month head-to-head clinical trial and a 72-month single arm trial evaluating long-term responses with imatinib. Nilotinib as a second-line therapy was allowed for patients who progressed while on imatinib. Drug costs were obtained from the *Red Book*. Hospital and outpatient costs were obtained from reimbursement rates from the Centers for Medicare and Medicaid Services. Sensitivity analyses were conducted to test various assumptions. **RESULTS:** The base case analysis resulted in 0.1 life years gained for nilotinib compared to imatinib. Resultant quality-adjusted life years (QALYs) for nilotinib and imatinib were estimated to be 4.39 and 4.23, respectively. The additional cost for treating with nilotinib was $213,895, resulting in an incremental cost effectiveness ratio (ICER) of greater than 1 million dollars per QALY saved. **CONCLUSIONS:** Based upon this analysis, the small additional survival benefits associated with nilotinib do not translate into a favorable ICER for first-line treatment of CML in chronic phase.

PCN87

COST-EFFECTIVENESS OF HORMONE THERAPIES FOR ER+ WOMEN WITH EARLY BREAST CANCER IN CANADA: EXPLORING THE POTENTIAL FOR THE CYP2D6 GENETIC TEST

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BACKGROUND: Approximately 60% of breast cancer cases are hormone sensitive. Tamoxifen is the most widely used treatment of hormone-dependent breast cancer. The pharmacological activity of tamoxifen is dependent on its conversion by the hepatic drug-metabolizing enzyme CYP2D6. Patients with reduced CYP2D6 activity may derive inferior therapeutic benefit from tamoxifen, and may alternatively be treated with newer aromatase inhibitors (AIs) sequentially or as monotherapy. However, the higher costs of AIs provide incentive for identifying patients who will benefit from tamoxifen prior to treatment. **OBJECTIVES:** To evaluate the cost-effectiveness of adjuvant mono and sequential hormone therapies, and CYP2D6 testing in combination with tamoxifen mono and sequential (with AIs) therapies for ER+ hormone sensitive women with early breast cancer in Canada. **METHODS:** We performed a cost-effectiveness analysis using a Markov model from a societal perspective with a lifetime horizon. An embedded decision tree was used to identify best treatment strategy according to CYP2D6 gene polymorphisms. Our comparator is optimal treatment strategy without genetic testing. Patient population is 65-year-old ER+ hormone sensitive women with early breast cancer. Expected value of perfect information was performed to identify future research directions. Probabilistic sensitivity analysis was used to incorporate parameter uncertainties. Outcomes were quality-adjusted life years (QALYs) and costs. **RESULTS:** Our preliminary analysis suggested that the genetic testing and treatment combination strategy were marginally more effective (0.005 QALY gained) and cost CAD $102 more when compared to no testing (letrozole-tamoxifen sequential therapy). The incremental cost-effectiveness ratio (ICER) for the base case was $21,732 per QALY. The results were sensitive to assumptions related to disease progression, mortality rate and the drug cost. **CONCLUSIONS:** The marginal gain in effectiveness and extra cost may not warrant a recommendation for routine CYP2D6 genetic testing in combination with tamoxifen monotherapy for ER+ women with early breast cancer in the current setting.

PCN88

COST-EFFECTIVENESS ANALYSIS OF PLERIXAFOR FOR STEM CELL MOBILIZATION FOR POOR MOBILIZERS IN CANADA

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OBJECTIVES: The cost-effectiveness analysis compares plerixafor + GCSF for stem cell mobilization in Canada compared to using GSCF alone or GCSF + chemotherapy in patients with multiple myelemo (MM) or non-Hodgkins's lymphoma (NHL) whose cells mobilize poorly. NHL and MM are severe forms of hematological cancer where autologous hematopoietic stem cell (HSC) transplantation is a standard of care in Canada. In order to proceed to transplantation, a sufficient number of stem cells need to be harvested during apheresis. Patients who collect 2 million HSCs proceed to transplant. Those whose peripheral blood CD34+ cell count on the day before apheresis is below the range of 10 to 20 cells/uL is generally considered a poor mobilizer. **METHODS:** The model uses a cohort semi-Markov process that embeds two decision trees for autologous transplantation and continuation of care. The Markov structure based on annual cycles consists of three health states - Remission, Well and Death. The mobilization decision tree includes the pre-apheresis, apheresis and transplant pathways. The continuation of care includes a series of therapies currently used in Canadian clinical practice following failed mobilization or relapse. Patients enter remission after successful transplantation and continuation of care after unsuccessful transplantation. **RESULTS:** The results showed that incremental cost-effectiveness ratio (ICER) for plerixafor + GCSF verses GCSF alone was $19,191 for NHL and $60,835 for MM. When compared to GCSF + chemo, the ICER was $14,330 for NHL and $31,622 for MM patients. Deterministic sensitivity analysis was conducted to assess extreme values and model uncertainty. Probabilistic sensitivity analysis was conducted to generate cost-effectiveness acceptability curves. Major data limitations include probability of successful mobilization and number of apheresis days for GCSF+chemo comparator. **CONCLUSIONS:** The results show that plerixafor + GCSF, when used in the poor mobilizer setting, is a cost-effective strategy for both NHL and MM patients in Canada.

PCN89

ECONOMIC EVALUATION OF ERLOTINIB AS TREATMENT OF OR METASTASIC CANCER OF NON-SMALL CELL LUNG CANCER (NSCLC) PRIOR CHEMOTHERAPY IN MEXICO

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OBJECTIVES: To identify the drug that offers the best pharmacoeconomic result for the treatment of advanced or metastatic NSCLC previously treated with a chemotherapy regimen in public health institutions in Mexico. **METHODS:** It was developed a cost-utility analysis using a Markov model with monthly cycles in a time horizon of 2 years. The main output indicators were: Years of Quality Adjusted Life (QALY's) and total treatment cost per patient. The alternatives in the study were: Erlotinib, Docetaxel and Pemetrexed. Costs are expressed in US dollars. **RESULTS:** The average cost per patient for Erlotinib was $9,862, and $21,583 to $24,049 for Docetaxel and Pemetrexed. Erlotinib provided 0.33 QALY's, while Docetaxel pro-